(1) GENERAL INFORMATION:

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       Arlinghaus, Ralph B.
       Platsoucas, Chris D.
       Nehete, Pramod N.

  (ii) TITLE OF INVENTION: METHODS AND COMPOSITIONS FOR ELICITING
     AN IMMUNE RESPONSE

  (iii) NUMBER OF SEQUENCES: 46

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  (v) COMPUTER READABLE FORM:
     (A) MEDIUM TYPE: Floppy disk
     (B) COMPUTER: IBM PC compatible
     (C) OPERATING SYSTEM: PC-DOS/MS-DOS
     (D) SOFTWARE: PatentIn Release #1.0, Version #1.30

  (vi) CURRENT APPLICATION DATA:
     (A) APPLICATION NUMBER: US 08/869,386
     (B) FILING DATE: 05-JUN-1997
     (C) CLASSIFICATION: Unknown

  (vii) PRIOR APPLICATION DATA:
     (A) APPLICATION NUMBER: US 07/945,865
     (B) FILING DATE: 16-SEP-1992

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(2) INFORMATION FOR SEQ ID NO:1:

  (i) SEQUENCE CHARACTERISTICS:
     (A) LENGTH: 15 amino acids
     (B) TYPE: amino acid
     (C) STRANDEDNESS:

(D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

    Arg Ile Gln Arg Gly Pro Gly Arg Ala Phe Val Thr Ile Gly Lys
    1   5   10   15

(2) INFORMATION FOR SEQ ID NO:2:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 19 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

    Cys Arg Ile Lys Gln Ile Ile Asn Met Trp Gln Gly Val Gly Lys Ala
    1   5   10   15

    Met Tyr Ala

(2) INFORMATION FOR SEQ ID NO:3:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 24 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

    Asn Asn Thr Arg Lys Ser Glu Arg Ile Gln Arg Gly Pro Gly Arg Ala
    1   5   10   15

    Phe Val Thr Ile Gly Lys Ile Gly
                    20

(2) INFORMATION FOR SEQ ID NO:4:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 13 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

    Glu Gln Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val
    1   5   10

(2) INFORMATION FOR SEQ ID NO:5:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 8 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

    Arg Ala Phe Val Thr Ile Gly Lys
    1   5

(2) INFORMATION FOR SEQ ID NO:6:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 13 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

    Thr Lys Gly Pro Gly Arg Val Ile Tyr Ala Thr Gly Gln
    1   5   10

(2) INFORMATION FOR SEQ ID NO:7:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 13 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

    His Ile Gly Pro Gly Arg Ala Phe Tyr Thr Thr Lys Asn
    1   5   10

(2) INFORMATION FOR SEQ ID NO:8:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 11 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

```
        Thr Tyr Gln Arg Thr Arg Ala Leu Val Thr Gly
        1               5                   10
```

(2) INFORMATION FOR SEQ ID NO:9:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 16 amino acids
          (B) TYPE: amino acid
          (C) STRANDEDNESS:
          (D) TOPOLOGY: linear

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

```
        His Gly Glu Phe Ala Pro Gly Asn Tyr Phe Ala Leu Trp Ser Tyr Ala
        1               5                   10                  15
```

(2) INFORMATION FOR SEQ ID NO:10:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 25 amino acids
          (B) TYPE: amino acid
          (C) STRANDEDNESS:
          (D) TOPOLOGY: linear

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

```
        Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys Ser Ile Arg Ile Gln Arg
        1               5                   10                  15

        Gly Pro Gly Arg Ala Phe Val Thr Ile
                    20                  25
```

(2) INFORMATION FOR SEQ ID NO:11:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 24 amino acids
          (B) TYPE: amino acid
          (C) STRANDEDNESS:
          (D) TOPOLOGY: linear

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

```
        Tyr Asn Lys Arg Lys Arg Ile His Ile Gly Pro Gly Arg Ala Phe Tyr
        1               5                   10                  15

        Thr Thr Lys Asn Asn Ile Gly Cys
                    20
```
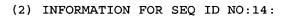
(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

    Arg Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Thr Thr Lys Asn
    1   5   10   15

(2) INFORMATION FOR SEQ ID NO:13:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

    Ser Leu Ser Ile Gly Pro Gly Arg Ala Pro Arg Thr Arg Glu Ile
    1   5   10   15

(2) INFORMATION FOR SEQ ID NO:14:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 24 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

    Asn Asn Thr Arg Lys Ser Ile Thr Lys Gly Pro Gly Arg Val Ile Tyr
    1   5   10   15

    Ala Thr Gly Gln Ile Ile Gly Asp
                20

(2) INFORMATION FOR SEQ ID NO:15:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

    Gly Ile Ala Ile Gly Pro Gly Arg Thr Leu Tyr Ala Arg Glu Lys

```
            1                  5                  10                 15


(2)  INFORMATION FOR SEQ ID NO:16:

     (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 15 amino acids
          (B)  TYPE: amino acid
          (C)  STRANDEDNESS:
          (D)  TOPOLOGY: linear

     (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:16:

     Ser Ile Thr Lys Gly Pro Gly Arg Val Ile Tyr Ala Thr Gly Gln
     1                  5                  10                 15


(2)  INFORMATION FOR SEQ ID NO:17:

     (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 15 amino acids
          (B)  TYPE: amino acid
          (C)  STRANDEDNESS:
          (D)  TOPOLOGY: linear

     (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:17:

     Arg Val Thr Leu Gly Pro Gly Arg Val Trp Tyr Thr Thr Gly Glu
     1                  5                  10                 15


(2)  INFORMATION FOR SEQ ID NO:18:

     (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 15 amino acids
          (B)  TYPE: amino acid
          (C)  STRANDEDNESS:
          (D)  TOPOLOGY: linear

     (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:18:

     Ser Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Ala Thr Gly Asp
     1                  5                  10                 15


(2)  INFORMATION FOR SEQ ID NO:19:

     (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 15 amino acids
          (B)  TYPE: amino acid
          (C)  STRANDEDNESS:
          (D)  TOPOLOGY: linear

     (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:19:
```

```
Ser Ile Arg Ile Gly Pro Gly Lys Val Phe Thr Ala Lys Gly Gly
1               5                   10                  15
```

(2) INFORMATION FOR SEQ ID NO:20:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

```
Ser Ile Tyr Ile Gly Pro Gly Arg Ala Phe His Thr Thr Gly Arg
1               5                   10                  15
```

(2) INFORMATION FOR SEQ ID NO:21:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

```
Gly Ile His Phe Gly Pro Gly Gln Ala Leu Tyr Thr Thr Gly Ile
1               5                   10                  15
```

(2) INFORMATION FOR SEQ ID NO:22:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

```
Ser Ile Ser Ile Gly Pro Gly Arg Ala Phe Phe Ala Thr Thr Asp
1               5                   10                  15
```

(2) INFORMATION FOR SEQ ID NO:23:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Ser Thr Pro Ile Gly Leu Gly Gln Ala Leu Tyr Thr Thr Arg Gly
1   5   10   15

(2) INFORMATION FOR SEQ ID NO:24:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Ser Thr Pro Ile Gly Leu Gly Gln Ala Leu Tyr Thr Thr Arg Ile
1   5   10   15

(2) INFORMATION FOR SEQ ID NO:25:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Arg Thr Pro Thr Gly Leu Gly Gln Ser Leu Tyr Thr Thr Arg Ser
1   5   10   15

(2) INFORMATION FOR SEQ ID NO:26:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Arg Ile His Ile Gly Pro Gly Ala Arg Phe Leu Thr Thr Lys Asn
1   5   10   15

(2) INFORMATION FOR SEQ ID NO:27:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15 amino acids
        (B) TYPE: amino acid

(C) STRANDEDNESS:
                    (D) TOPOLOGY: linear

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

        Arg Ile His Ile Gly Pro Gly Arg Ala Phe Phe Thr Thr Lys Asn
        1   5   10   15

(2) INFORMATION FOR SEQ ID NO:28:

        (i) SEQUENCE CHARACTERISTICS:
                    (A) LENGTH: 11 amino acids
                    (B) TYPE: amino acid
                    (C) STRANDEDNESS:
                    (D) TOPOLOGY: linear

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

        Val Tyr Tyr Gly Val Pro Val Trp Lys Glu Ala
        1   5   10

(2) INFORMATION FOR SEQ ID NO:29:

        (i) SEQUENCE CHARACTERISTICS:
                    (A) LENGTH: 13 amino acids
                    (B) TYPE: amino acid
                    (C) STRANDEDNESS:
                    (D) TOPOLOGY: linear

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

        Gly Val Pro Val Trp Lys Glu Ala Thr Thr Leu Phe Cys
        1   5   10

(2) INFORMATION FOR SEQ ID NO:30:

        (i) SEQUENCE CHARACTERISTICS:
                    (A) LENGTH: 11 amino acids
                    (B) TYPE: amino acid
                    (C) STRANDEDNESS:
                    (D) TOPOLOGY: linear

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

        Ala His Lys Val Trp Ala Thr His Ala Cys Val
        1   5   10

(2) INFORMATION FOR SEQ ID NO:31:

        (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 12 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

    Cys Val Pro Thr Asn Pro Val Pro Gln Glu Val Val
    1   5   10

(2) INFORMATION FOR SEQ ID NO:32:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 11 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

    Val Leu Glu Asn Val Thr Glu Asn Phe Asn Met
    1   5   10

(2) INFORMATION FOR SEQ ID NO:33:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 11 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

    Asn Asn Met Val Glu Gln Met His Glu Asp Ile
    1   5   10

(2) INFORMATION FOR SEQ ID NO:34:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 13 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

    Glu Gln Met His Glu Asp Ile Ile Ser Leu Trp Asp Gln
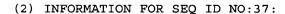   1   5   10

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 13 amino acids
             (B) TYPE: amino acid
             (C) STRANDEDNESS:
             (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

    Leu Trp Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr
    1   5   10

(2) INFORMATION FOR SEQ ID NO:36:

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 12 amino acids
             (B) TYPE: amino acid
             (C) STRANDEDNESS:
             (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

    Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys
    1   5   10

(2) INFORMATION FOR SEQ ID NO:37:

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 13 amino acids
             (B) TYPE: amino acid
             (C) STRANDEDNESS:
             (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

    Ser Val Ile Thr Gln Ala Cys Ser Lys Val Ser Phe Glu
    1   5   10

(2) INFORMATION FOR SEQ ID NO:38:

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 14 amino acids
             (B) TYPE: amino acid
             (C) STRANDEDNESS:
             (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

    Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Phe Pro Gly Phe
    1   5   10

(2) INFORMATION FOR SEQ ID NO:39:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 11 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

Lys Lys Phe Asn Gly Thr Gly Pro Cys Thr Asn
1   5   10

(2) INFORMATION FOR SEQ ID NO:40:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 13 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Gly Thr Gly Pro Cys Thr Asn Val Ser Thr Val Gln Cys
1   5   10

(2) INFORMATION FOR SEQ ID NO:41:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 14 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

Val Gln Cys Thr His Gly Ile Arg Pro Val Val Ser Thr Gln
1   5   10

(2) INFORMATION FOR SEQ ID NO:42:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 13 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

Tyr Leu Arg Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys

(2) INFORMATION FOR SEQ ID NO:43:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 25 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

Phe Leu Gly Phe Leu Gly Ala Ala Gly Ser Thr Met Gly Ala Ala Ser
1   5   10   15

Leu Thr Leu Thr Val Gln Ala Asn Gln
           20   25

(2) INFORMATION FOR SEQ ID NO:44:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 28 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

Cys Arg Ile Lys Gln Ile Ile Asn Met Trp Gln Gly Val Gly Lys Ala
1   5   10   15

Met Tyr Ala Pro Pro Ile Gly Gly Gln Ile Arg Cys
           20   25

(2) INFORMATION FOR SEQ ID NO:45:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 36 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys Ser Ile Arg Ile Gln Arg
1   5   10   15

Gly Pro Gly Arg Ala Phe Val Thr Ile Gly Lys Ile Gly Asn Met Arg
           20   25   30

Gln Ala His Cys

(2) INFORMATION FOR SEQ ID NO:46:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 16 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS:
        (D) TOPOLOGY: linear

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

Lys Gln Ile Ile Asn Met Trp Gln Glu Val Gly Lys Ala Met Tyr Ala
1   5   10   15